

Unit 8 - Week-7: Quantitative Proteomics

Course outline

How to access the portal ?

Week-1: Basics of proteins and proteomics

Week-2: Gel-based proteomics

Week-3: Two-dimensional gel electrophoresis (2-DE)

Week-4: Difference in gel electrophoresis (DIGE) & Systems Biology

Week-5: Basics of mass spectrometry

Week-6: Basics of mass spectrometry and sample preparation

Week-7: Quantitative Proteomics

- L31. Introduction to quantitative proteomics
- L32. SILAC: In vivo labeling
- L33. iTRAQ: In vitro labeling
- L34. TMT: In vitro labeling
- L35. Quantitative proteomics data analysis
- Download Videos
- Weekly Feedback
- Quiz : Week-7 Assignment

Week-8: Advancement in Proteomics

Text Transcripts

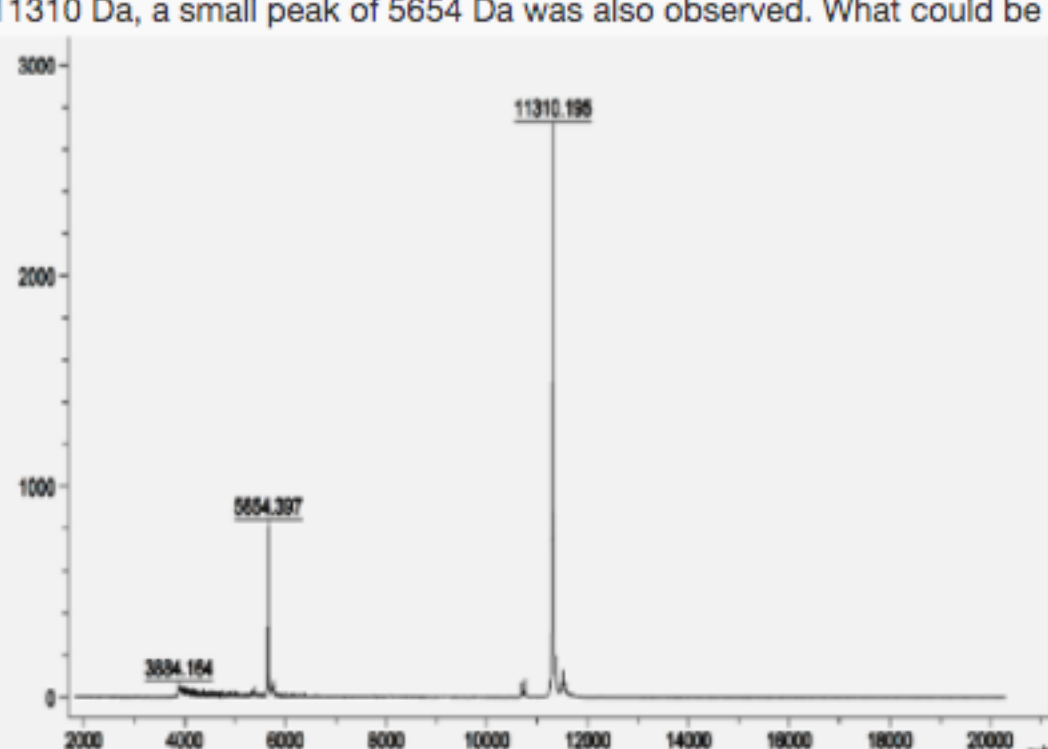
Week-7 Assignment

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2019-10-16, 23:59 IST.

Week-7 Assignment

1) Given to you below is a spectra obtained during molecular weight determination of a monomeric protein through MALDI-MS analysis. When the molecular weight was determined through gel filtration chromatography, it was found to be ~11 kDa, however, in MALDI analysis along with the major peak of 11310 Da, a small peak of 5654 Da was also observed. What could be the most probable reason for that? 1 point



- Random fragmentation due to hard ionization technique used
- Other peak corresponds to the protein subunit
- Protein is not solubilized properly
- Other peak represents the doubly charged state

No, the answer is incorrect.

Score: 0

Accepted Answers:

Other peak represents the doubly charged state

2) Which of the following is the most important aspect of planning and designing a good proteomics experiment? 1 point

- Effective data analysis
- Robust sample preparation methods
- Appropriate sample and control choice
- All of the above

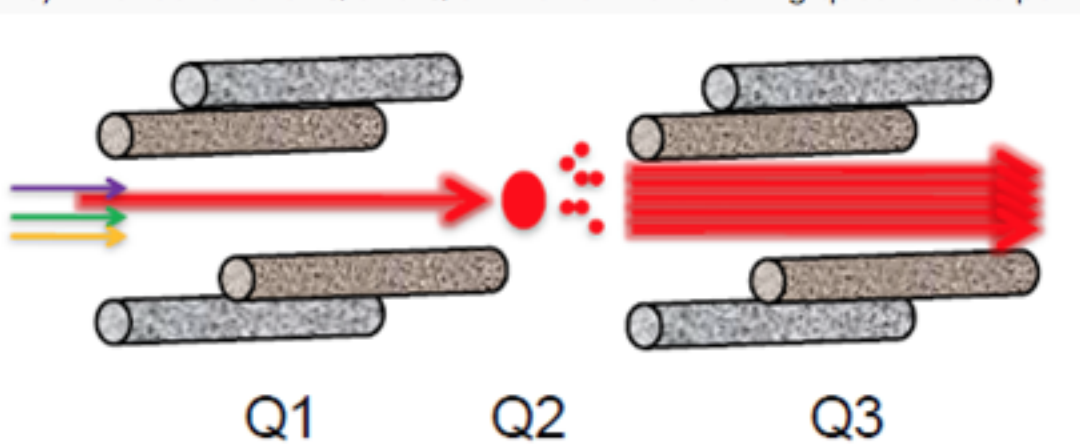
No, the answer is incorrect.

Score: 0

Accepted Answers:

All of the above

3) Instructions for Q.3 to Q.5. Answer the following questions as per the following figure. 1 point



What is the function of second quadrupole?

- Scans the stream of ions emerging from the Q1
- It directs the intact peptide to Q3
- It is a collision cell where intact peptide collides with Argon gas
- It is a detector

No, the answer is incorrect.

Score: 0

Accepted Answers:

It is a collision cell where intact peptide collides with Argon gas

4) Which of the following statement is/are NOT correct about Q1? 1 point

- It scan the ion stream and direct a specific m/z to the next quad
- It directs an intense precursor to collision cell
- It runs on scanning mode
- It is a collision cell

No, the answer is incorrect.

Score: 0

Accepted Answers:

It is a collision cell

5) Which of the following scans stream of ion fragments to generate a CID spectrum? 1 point

- Q1
- Q2
- Q3
- Both Q1 and Q2

No, the answer is incorrect.

Score: 0

Accepted Answers:

Q3

6) If you require a sample preparation workflow to enrich a particular population of proteins from cultured cells, what would be an appropriate method of quantification? 1 point

- DIGE
- TMT
- SILAC
- iTRAQ

No, the answer is incorrect.

Score: 0

Accepted Answers:

SILAC

7) Which of the following strategy can be used to increase the overall proteome coverage by LC-MS/MS? 1 point

- Label-free quantification
- Label the proteins with a chemical tag
- Enrich for phosphoproteins only
- Label the proteins using Cy dyes

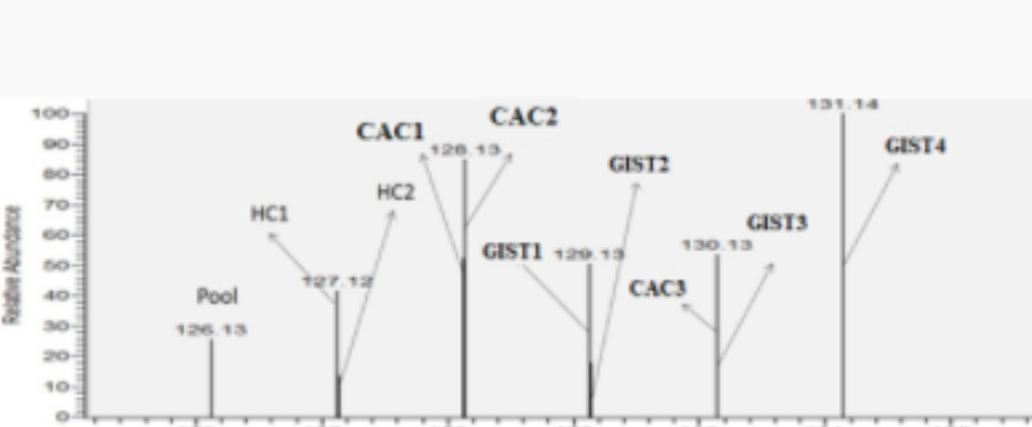
No, the answer is incorrect.

Score: 0

Accepted Answers:

Label-free quantification

8) Instructions for Q.8 to Q.9. A researcher has performed TMT multiplex experiment. He has three types of samples; HC (Healthy control), CAC (Colon Adenocarcinoma) and GIST (Gastrointestinal Stromal). The following spectrum has been obtained for Cyclin Dependent Protein Kinase 2 (CDK2). 1 point



What is the use of TMT0 reagent provided in TMT duplex, TMT 6-plex and TMT 10-plex kits?

- It labels the standard sample
- It is used in method development
- It is used for doing quality control check of sample
- It is used to label the real sample

No, the answer is incorrect.

Score: 0

Accepted Answers:

It is used in method development

9) In above mentioned experiment, which TMT kit has been used for a quantitative proteomic experiment? 1 point

- TMT0
- TMT duplex
- TMT 6-plex
- TMT 10-plex

No, the answer is incorrect.

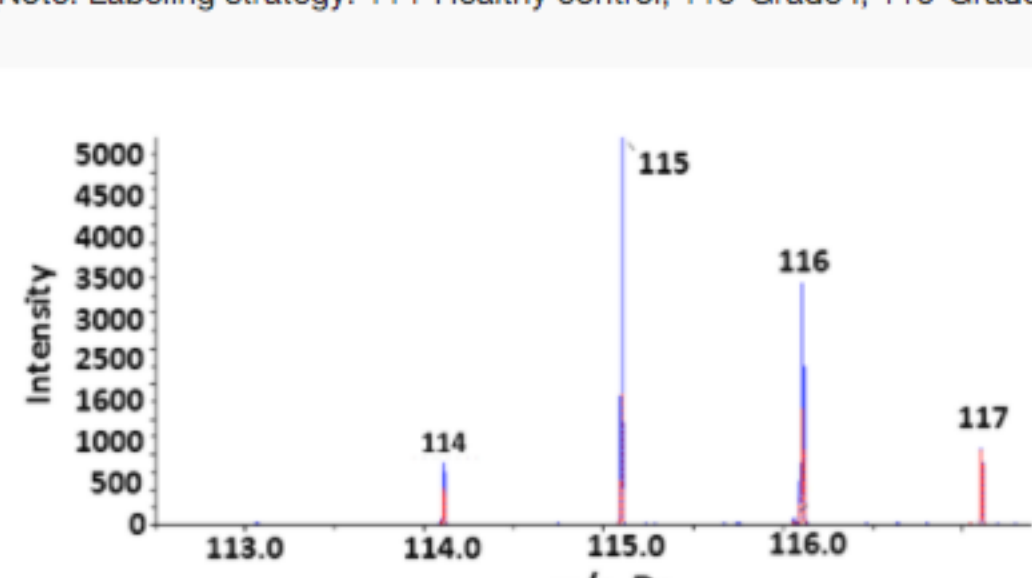
Score: 0

Accepted Answers:

TMT 10-plex

10) The following spectrum was obtained for the S100A8 protein using iTRAQ-based quantitative proteomics study of Gastric cancer patients. Which of the following statement is TRUE? 1 point

(Note: Labeling strategy: 114-Healthy control, 115-Grade I, 116-Grade II, 117-Grade III)



- The expression of S100A8 decreases in Grade III with respect to healthy controls
- The expression of S100A8 in healthy control is much higher than gastric cancer
- As compared to healthy S100A8 levels are higher in every grade of gastric cancer
- The expression level of S100A8 is similar in Grade II and Grade III

No, the answer is incorrect.

Score: 0

Accepted Answers:

As compared to healthy S100A8 levels are higher in every grade of gastric cancer